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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,126

04/08/2004

Toshihumi Kakutani

00862.018069

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06/15/2006

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EXAMINER

WRIGHT, KAINOA

ART UNIT

PAPER NUMBER

2861

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/820,126

Applicant(s)

KAKUTANI ET AL.

Examiner

Kainoa BK Wright

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 04/08/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Lines 2 & 3 of the claim reads, "...light emitting element is arranged more apart from said light emitting pinhole..." It is unclear what distance applicant intends to distinguish away from with the term "more apart". Suggested corrections include: more apart than X, where X is some other distance; or the deletion of "more".

For purposes of examination, the claim shall be interpreted as, "...light emitting element is arranged ~~more~~ apart from said light emitting pinhole..."

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1, 3 and 4 rejected under 35 U.S.C. 103(a) as being unpatentable over one embodiment of Nagamochi et al. (JP 06-281572) in view another embodiment of Nagamochi et al. (JP 06-281572).

Regarding claim 1, a first embodiment teaches a sensor comprising a light emitting element 81, light emitting pinhole 84 that focuses light without a lens, light receiving pinhole 85, and light receiving element 82 (see Figure 3).

The embodiment of Figure 3 fails to specifically teach a spot diameter less than the light receiving pinhole diameter.

A second embodiment of Nagamochi et al. teaches a spot diameter less than the light receiving pinhole diameter (see Figure 8 & 9).

Nagamochi et al. in general, teaches that the spot area S2 should be less than the read area S1 in order to preserve precision in detection [0035]. One obvious way to preserve this ratio is to allow the diameter of the light receiving pinhole to be larger than the spot from which the received light is issuing from. This is a well-known optical phenomenon wherein if one wishes to capture all the light from a source, the relationship between the diameters of the viewing aperture and the light source must be such that, at an increasing distance between the source and the receiver, the relative diameter for the receiving hole must increase.

Figure 8 illustrates a condition where a spot diameter is clearly smaller than the hole diameter. Although the figure shows a lens as a means for focusing the light to a smaller diameter than the diameter of the receiving

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pinhole, the light emitting pinhole of Figure 3 could just as easily be used as the focusing means without diverging from the essence of Nagamochi et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the embodiments of Nagamochi et al. such that light is focused, by an emitting pinhole, to a spot whose diameter is less than the diameter of a receiving pinhole, in order to maintain the precision of detection ratio  $S2 < S1$ , as taught by Nagamochi et al.

Regarding claim 3, Nagamochi et al. teaches the limitations of claim 1 and further teaches that the light emitting element 81 be positioned apart from the light emitting pinhole 84, as shown in Figure 3.

Regarding claim 4, Nagamochi et al. teaches the limitations of claim 1 and further teaches the absence of a lens in the area between the light receiving element and the light receiving pinhole, as shown in Figure 3.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagamochi et al (JP 06-281572) in view of Tamai et al. (US 4510504).

Regarding claim 2, Nagamochi et al. teaches the limitations of claim 1 including an image sensor comprising a light emitting pinhole and a light receiving pinhole.

Nagamochi et al. fails to teach that the light emitting pinhole be of a smaller diameter than the light receiving pinhole.

Tamai et al. teaches a sensor comprising a light emitting hole that is smaller than a light receiving hole, as shown in Figure 8.

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In keeping with the essence of Nagamochi et al., that is to say that the illuminated spot area be less than the read area, it would have been obvious to one of ordinary skill in the art at the time of the invention, to modify Nagamochi et al. to include a receiving pinhole larger than an emitting pinhole, as illustrated by Tamai et al., in order to provide that the spot diameter be smaller than the read area.

6. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagamochi et al. (JP 06-281572) in view of Tajima (US 6836277).

Nagamochi et al. teaches the limitations of claim 1 including an image sensor.

Nagamochi et al. fails to teach the image sensor in combination with an image forming apparatus comprising a plurality of image forming means; and a looped belt member, wherein a mis-registration is detected by the image sensor detecting a registration pattern, the pattern having been formed on the belt; and wherein the mis-registration is to be corrected.

Regarding claim 5, Tajima teaches an image mis-registration sensor 12 in combination with a plurality of image forming devices 1, a belt member 2 (see Figures 1 & 2). As is well known in the art and illustrated by Tajima, the operation of the image sensor is such that the sensor detects a registration mark in order to determine a mis-registration.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the sensor of Nagamochi et al. within Tajima in order to detect a mis-registration, as is well known in the art.

Regarding claim 7, Nagamochi et al. in view of Tajima teaches the limitations of claim 5. Tajima further teaches that the belt member be an intermediate transfer belt 6 on which an image is formed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use an intermediate transfer belt as the belt member, as is well known in the art.

Regarding claim 6, official notice is taken that the use of either an intermediate transfer belt or a sheet-conveying belt as means to transfer an image onto a printing medium is old and well known.

It would have been obvious to one of ordinary skill in the art at the time of the invention, to alternatively use a sheet-conveying belt to transfer an image to a printing medium instead of using an intermediate transfer belt.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. King et al. (2003/0001917); Shiraishi (2005/0110860); Kojima et al. (2004/0109039); Adkins et al. (2003/0122866); Takada et al. (US 5736996); Komiya et al. (US 4778280).


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kainoa BK Wright whose telephone number is (571) 272-5102. The examiner can normally be reached on M-F 8:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAI  
6/9/2006

  
HAI PHAM  
PRIMARY EXAMINER